Consumers' Attitude towards E-Banking Services in Islamic Banks: The Case of Sudan

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ABSTRACT

This paper provided an analysis of the attitude towards three banking services technologies in Sudan, namely ATMs, mobile banking, and internet (online) banking. The paper started by conducting an exploratory factor analysis, on the valid responses received from a random sample of bank customers in the Sudan, towards the three technologies.

The study employed the Technology Acceptance Model (TAM) as a conceptual framework to investigate the factors that influence customers' acceptance and intention to use bank technologies. The study found that customers attitude toward various bank technologies is not the same, and is influenced by relatively different factors.

The results show that bank customers who are users of ATMs are influenced by its convenience, ease of use and service quality, while credibility is not considered as a significant driver. Mobile users are found to be more influenced by benefits and ease of use and service quality while internet customers are influenced by benefits and ease of use and credibility of the systems. Under the three models, attitude emerged as a fully mediating factor for customers behavioral intentions.

Introduction

Although banking technology in many countries has been around for a while, Sudan banking sector was not quick to ride the technology wave. This has taken place irrespective of Sudan well developed telecommunication sector, a vital infrastructure for technology-based banking.

The delay in adopting bank technology may be due in part, to the engagement of Sudanese banks in a process of improving their operations, customers' base, capitalization and more importantly improving their bottom lines.

It is also argued that in emerging countries the use of e-banking is weak especially in some African and Arab countries, due to the high initial costs and less than enough matching demand.

During the last five years or so, however, almost all banks in Sudan embraced the new technology and gradually started to offer technology-based services to their customers. The banking sector drive towards technology might have been partially an effort to put up with global standards. Other possible reasons may include cost reduction, the entrance of foreign banks into the

Sudanese market and the increased competition among banks.

However, it is not the technology but its acceptance, use, and adoption by bank customers that is important. There are no studies to date that provide evidence of customers' acceptance and use of these services, or the volume of bank business or profits derived from these services. This is especially important, because security concerns are always associated and attached with technology-based services.

Thus, this study represents an attempt to explore this untapped field of study. It aims to examine and identify the factors that influence Sudanese bank customers' acceptance of technology-based banking. The identification of such factors is very important for bank regulators, bank marketers and banks customers' base.

This paper is organized as follows: section II presents the literature review on technology- based banking and Technology Acceptance Model (TAM). Section III presents the research model and hypotheses; Section IV presents research methodology, analysis and results. Finally, section V presents the conclusions and implications of this study.

Literature Review

Changes in human life are, more often than not, met with reluctance and resistance. This is because change, to say the least, is associated with uncertainty.

Humans in general prefer certainty to risk and uncertainty, and they often stand ready to pay to resolve or reduce the uncertainty they face. Technological changes are not an exception, especially if their pace of change is rapid and costly.

Bank customers have been, for long time, accustomed to classical mode of banking, where customers interact and have encounters with banks personnel. The introduction of technology - based banking has changed the banking services scene altogether, as customers now are expected to have more active involvement in banking transactions. This additional burden on customers together with the uncertainty surrounding the process may not encourage customers to embrace the new banking technology.

Hence, the acceptance of technology must not be looked upon as an easy decision as may initially seems. Researchers have cited many problems facing customers when encountering such technological changes, such as anxiety and stress caused by the use of information technology (Mick Fournier, 1998), or the confusion about how arising technology problems may be solved (Meuter and Bitner, 1998).

Also, technology learning and acquisition is costly, especially in a developing country such as Sudan, where cost is likely to be a determining factor. Similarly, since technology- based banking is complex, additional skills and good educational background may be needed to deal with its operations. As stated by Salhieh et al (2011), e-banking carries with it many types of risk. Of special importance to customers are the operational risks and technology risks. The operational risks include fraud, processing errors, systems disruption. Technology risks, on the other hand, include system failures, processing errors, software defects, operating mistakes, hardware breakdown, capacity inadequacies, network vulnerabilities and security shortcomings, malicious attacks and hacking incidents.

On the other hand, the tremendous and rapid spread or rather explosion of technology underlies readiness, eagerness, and fondness on the side of the general public. As highlighted by Meuter et al (2000), the technology- based banking may be attractive to customers due to its ease of use or its convenience. Meuter and Bitner (1998) lists some reasons behind customers possible acceptance of new technologies, such as time and cost savings, greater control over the service delivery, reduced waiting time, and a higher perceived level of customization, flexibility, enhancement of the bank's reputation, and reaching new segments of the population. Other cited supporting factors include convenience of location, and enjoyment and fun (see Curran and Meuter, 2005, Sathye 1999, Brogdon, 1999)

It has to be noted that Curran and Meuter (2005) developed a self-service technology (SST) acceptance model and tested ATMs, phone banking and on-line banking on a sample of US bank customers.

The study concluded that different factors influence attitude towards each of these technologies and offer explanation of the varying degrees of acceptance found among consumers. Khalil and Pearson (2007) found that trust was a significant factor that affects customers' attitudes towards internet banking in Malaysia. Aderonke and Ayo (2010) applied an extended TAM to investigate the factors that influence users' acceptance and intention to use electronic banking in Nigeria. The study showed that ease of use, time saving and convenience are driving factors to use ATMs, while network and system security were major concerns of users. Salhieh et al (2011) proposed a framework to assess the level of bank's readiness

for providing e- banking services in Jordan.

The study sought the opinions and perceptions of bankers, customers and IT specialists in banks. The evidence supports that e-banking has achieved a degree of strategic and operational importance among bank managers and customers. Technological aspects and IT employees skills are paramount concerns.

In Sudan, a recent study by Tingari and Abdelrahman (2012), explores the evolution of bank technology in Sudan, by adopting an extended TAM, that encompass, perceived usefulness, perceived ease of use, perceived security and perceived service quality. Using a sample of responses to a questionnaire, the study found support to TAM ability to predict customers' intention to use banking technology in Sudan. The study found that demographics such as age, income, education and bank treatment period have no effect on customers' intention to use bank technology.

RESEARCH MODEL AND HYPOTHESES

The Technology Acceptance Model (TAM), developed by Davis (1989), is one of the most widely applied models used to explain the individual's acceptance of information systems. The TAM is an Information System (IS) theory adapted from the theory of reasoned action (TRA), which was specifically designed for modeling acceptance of information systems by potential users. The primary purpose of the TAM is to predict IS/IT acceptance and diagnose design problems before users actually use new systems. Therefore, the TAM has been widely used for the purpose of predicting, explaining and increasing the understanding of user acceptance of information systems in various fields.TAM has more clear focus on the IT/IS usage.

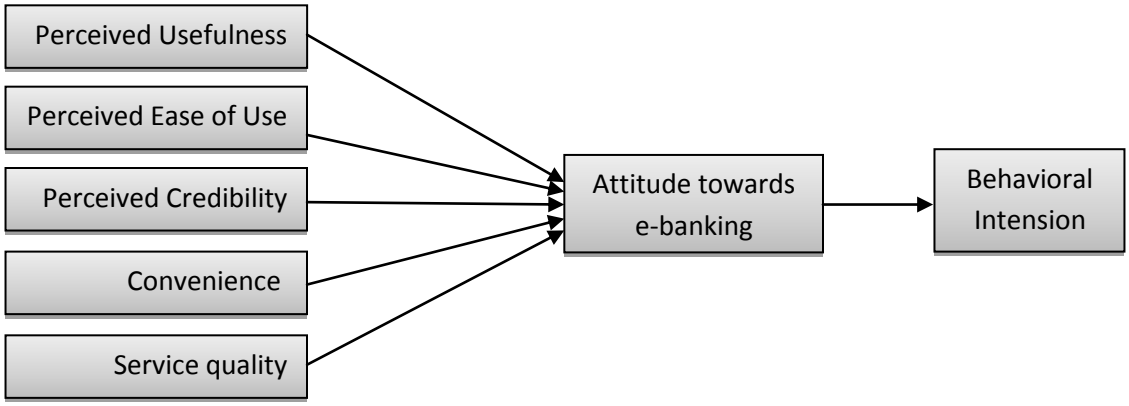
The TAM has been extensively used solely for the purpose of predicting, explaining and increasing the understanding regarding individual's acceptance of technology in variety of fields. It is important to note here, that the present study applies TAM-based findings as the basis for the theoretical model development.

The TAM uses TRA to specify causal linkage between two relevant sets of constructs, perceived usefulness and perceived ease of use, user attitude towards using, behavioral intention and actual usage behavior.

In order to gain more understanding on consumers adoption of electronic banking services, the model shown below (Figure 1) was adapted from the literature namely, Guriting and Nelson (2006), Pikkarainen*et al.*

(2004), Wang *et al.* (2003), Venkatesh (2000) and Davis (1989) who propose five antecedents beliefs as predictors of consumers, intention to use electronic banking services which is PU, PEOU and two more added variables perceived credibility and convenience and service quality

Figure 1:Research framework for e-banking acceptance



Perceived Usefulness (PU):

According to Davis (1989), perceived usefulness is defined here as the degree to which a person believes that using a particular system would enhance his or her job performance. In the TAM, PU is a significant factor having a strong influence in determining user acceptance of IS (Davis, 1989; Davis et al., 1989). Several researchers have provided evidence of the significant effect of PU on IS acceptance and usage (Davis, 1989; Pikkarainen et al., 2003; Wang et al., 2003; Chan and Lu, 2004). PU is often found to have a stronger relationship with intended system use compared to the ease of use. This significance of PU suggests that users are generally inclined or more likely to accept a system primarily because of the functions it performs, implying that the ease of use cannot compensate for a system that does not provide the required functionality (Davis, 1989). Similarly, in the electronic banking systems context, if users think that system is useful then they are more likely to accept it.

Therefore, in accordance with the TAM, it is hypothesized that PU would have a significant positive influence on users' acceptance of electronic banking. Consequently, the first hypothesis developed for this study is as follows:

H1: Perceived usefulness will have a significant positive effect on consumers' attitude towards electronic banking services.

Perceived Ease of Use

Prior research has empirically shown that perceived ease of use (PEOU) is another major determinant of user acceptance which has a positive effect on intended system use (Davis, 1889; Igbaria et al., 1997; Davis, 1989; Pikkarainen et al., 2003; Wang et al., 2003; Chan and Lu, 2004; Gefen et al., 2003; Venkatesh and Davis, 2000). According to Davis (1989), perceived ease of use is "the degree to which a person believes that using a particular system would be free of efforts". The TAM posits that PEOU is an important factor that affects IS acceptance, either directly or indirectly through perceived usefulness (Davis et al., 1989).

Venkatesh and Davis (2000) found that PEOU has a positive direct effect on user acceptance of IS. Other studies have found that PEOU has a significant effect on the PU (Adams et al., 1992; Davis et al., 1989; Gefen and Straub, 2000; Igbaria et al., 1997). Davis (1989) on the relationship between PEOU and PU suggests that "from a causal perspective, the regression results suggest that ease of use may be an antecedent of usefulness, rather than a parallel, direct determinant of usage".

According to the TAM, the direct effect of PEOU on PU is explained by increased PEOU, which results in improved performance by saving effort needed to do the same work. Similarly, if electronic banking systems are easy to use; they are more likely to be accepted by the intended users. Therefore, consistent with TAM, it is hypothesized that PEOU has an influence on user acceptance of electronic banking both directly and indirectly through its effect on the PU. This hypothesis is summarized as follows:

H2: Perceived ease of use will have a significant positive effect on consumers' attitude towards electronic banking service.

Perceived Credibility

According to Hanudin (2007), perceived credibility (PCRD) is a determinant of behavioral intention to use an information system. It consists of two important elements: privacy and security. Security refers to the protection of information or systems from unauthorized intrusions (Egwali, 2008). Fear of inadequate security is one of the factors that have been identified as impediments to the growth and development of e-commerce including electronic banking adoption (Ezeoha, 2005).

For the purpose of this research, "perceived credibility" (PCRD) is defined as users' perception of protection of their transaction details and personal data against unauthorized access. PCRD is about personal belief that a user has in the system to carry out a transaction securely and maintain

the privacy of personal information. Perceived credibility has also been tested and confirmed to have a significant effect on perceived ease of use and perceived usefulness (Karjaluoto 2002). Therefore, for studying the effect of perceived credibility on user's acceptance in Sudanese electronic banking services, we pose the following hypotheses to determine its effect on user's intention:

H3: *perceived credibility has positive effect on consumers' attitude towards electronic banking service*

Convenience

Electronic Banking offers convenience to its customers through time savings, and the 24-hours-7-days a week banking services without queuing or unnecessary waiting time. Dennis's and Papamatthaiou's (2003) study of e-shopping motivations found that convenience significantly correlated with intentions for online shoppers. Researchers have found a positive relationship between convenience perception and the use of Online Banking (Polatoglu and Ekin, 2001; Gerrard and Cunningham, 2003). Thus, this study states the following hypothesis:

H4: Convenience will have positive significant effect on consumers' attitude towards electronic banking service.

Service Quality

Service quality is defined as an individual's perception of how well a system performs tasks necessary to the user's job (Venkatesh and Davis, 2000).Service quality is defined as the customer's judgment about superiority or excellence of a product (Zeithaml, 1988). Service quality revolves around the idea of customers comparing their expectations about the service with their perception of the way the service has been performed (Gronroos, 1984). Whereas, Chismar and Wiley-Patton (2002) found that individuals' perception of output quality is related to the usefulness of systems. Venkatesh and Davis (2000) suggested that when a set of multiple relevant IS are available, then systems delivering the highest output quality are chosen by people. Venkatesh and Davis's (2000) argued that increased output quality is likely to improve an individual's job performance; thus, influencing his perception of usefulness**.**

Therefore, consistent with findings obtained from previous published literature, this study hypothesizes that service quality would have an influence on the perception of attitude towards electronic banking. Thus it is suggested as follows:

H5. Service Quality will have a significant positive effect on consumers' attitude towards electronic banking services.

Attitude towards the behavior*:* refers to the degree to which performance of behavior is positively or negatively valued. Ajzen & Fishbein (1980) have demonstrated that an individual's attitude towards any object can be predicted with a high degree of accuracy from the knowledge of the individual's beliefs about the attitude object and the evaluation aspect of these beliefs. According to Ajzen & Fishbien's model, this person's attitude towards e-banking is a function of the strength with which he/she holds these beliefs (the person's subjective probability that e-banking is related to the different attributes) and his/her evaluation of each attribute.

Consumer's attitudes have a strong, direct and positive effect on consumers' intention to actually use new information system (Jahangir, et al., 2007). Understanding the determinants of consumers' attitude, it is argued that this attitude has a strong, direct, and positive effect on consumers' intentions to actually use the new technology or system (Hernandez and Mazzon, 2007). On this basis, the researchers expect that customer attitude affects the acceptance of electronic banking. Thus it is suggested as follows:

H6. Consumers' attitude towards e-banking will have a significant positive effect on users' intention to use electronic banking services.

IV: Research Methodology, Results and Analysis

A survey instrument is used in this study, as a three- part questionnaire was designed to convey a well written statements concerning the bank customers state of mind regarding various aspects of technology- based banking.

The three parts of the survey describe three banking technologies namely; Automated Teller Machines (ATM), Mobile banking, and internet- based banking services. The survey is intended to measure the five constructs, perceived usefulness, and perceived ease of use, Service quality, convenience, and credibility.

Three separate but similar versions of the survey were developed, reflecting the bank customers' attitude towards the technology and their intentions regarding each of the three technologies. A total of 132 questionnaires were distributed and feedback received, with 14 of the respondents have no bank accounts. The sample is diversified, spanning various age groups, educational levels and marital status.

Table (1) shows the Respondents profiles. The returned valid questionnaires show that all (118) used ATMs, 46 of them used mobile banking and 30 used the internet online banking services (see Table 3).

The respondents were directly asked to answer the section (s) covering the technology they are familiar with (used). All of the antecedents belief constructs were measured using a five-point Likert scale with endpoints of 1 (strongly disagree) and 5 (strongly agree). The attitudes and intentions constructs are measured in a similar way.

The sample characteristics, which are shown in table (1), reveal that 61% of the respondents were males while 39% are females. However, 85% of the respondents are private-sector employees and mostly, 60%, in the age range (26-45) and singles (63%). The majority of the sample, 98%, has university education at the undergraduate and graduate levels. Most of the respondents (93%) have bank accounts and 55% maintained their bank accounts for more than two years.

Table (1): Respondents bank customers' profile

Parameters		Frequency	%
Age	18-25	42	31.8%
	26-35	50	37.9
	36-45	29	22.0
	45-55	7	5.3
	>55	4	3.0
		132	**100**
Sex	Male	81	61.4
	Female	51	38.6
		132	**100**
Marital Status	Single	83	62.9
	Married	44	33.3
	Other	5	3.8
		132	**100**
Education	Below High School	1	0.8
	High School	1	0.8
	Graduate	50	37.9
	Post Graduate	80	60.60
		132	**100**
Occupation	Student	20	15.2
	Government Employee	31	28.5

	Private sector Self employed Worker	74 7 0 **132**	56.1 5.3 0 **100**
Income	<1000 1000-1999 1999-2999 3000-3999 4000-5000 >5000	28 39 27 12 4 22 **132**	21.2 29.5 20.5 09.1 03.0 16.7 **100**
Banking	Have bank account No bank account	123 9 **132**	93.2 6.8 **100**
Account maintenance	<6 month 6 month – year Year- 2 years >2 years	11 12 23 72 14 **132**	8.3 9.1 17.4 54.5 10.6 **100**

These responses, although not conclusive, may indicate that ATMs are widely used relative to the other bank technologies examined in this study. Both the internet and mobile banking are relatively new in Sudan, and many people are even not aware of their availability as banking services alternatives. Fifteen items were included in the survey for each of the three technologies in order to measure the respondents' attitude towards each. As table (3) shows, there were 194 valid responses on the three banking technologies. SPSS factor analysis is used to analyze the data in which 4 distinct factors are identified. These factors are "Benefits and Ease", "Service Quality", "Credibility", and "Convenience"."Benefits and Use" factor combines both Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). This combination is supported by the argument that TAM posits that PU is influenced by PEOU because, other things being equal, the easier a technology to use, the more useful it can be. These factor loadings are high and the overall variability explained is around 68% of the variability of the constructs (see table (2)). Cronbach's alphas are high for all the identified factors reflecting high degree of homogeneity within these factors

Table (2): Bank Technology Factor Loadings (the whole sample, n=194)

	FACT1	FACT2	FACT3
PU1	.667		
PU2	.786		
PU3	.786		
EOU1	.728		
EOU2	.742		
EOU3	.712		
CON1	.755		
SQ1			.761
SQ2			.832
SQ3			.853
CRD1		.871	
CRD2		.908	
CRD3		.834	
CON2	.687		
CON3	.634		
Cronbach's Alpha	.904	.908	.832
F test	10.325	10.59	5.92
Significance-p value	(.000)	(.000)	(.000)
% Variance explained	33.196%	18.116%	16.051%
% overall Variance explained			67.362%

Table (3): Sample by Type of Bank Technology

Bank Technology	Number of Respondents	% of overall sample
ATM: KMO Bartlett's test	118 0.798* 694.002 (0.000)*	89.4%
Mobile: KMO Bartlett's test	46 .798 538.35	34.8%
Internet: KMO Bartlett's test	30 .677* 458.92*	22.7%

- The sum exceeds 100% since some respondents use more than one type of bank technology.
- (*) significant at 1% level

However, based on the casual observations of the variation respondents had shown regarding their attitude towards each of the three banking technologies, an ANOVA test of all the 15 constructs items was conducted to check for any differences among the three technologies.

Table (4) shows significant differences among the three technologies over all items with only two exceptions. Thus it seems necessary to run separate factor analysis for each technology.

Table (4) ANOVA of Constructs by type of technology (ATM, Mobile, Internet)

Items	F-statistic	Significance
Perceived Utility (PU1)	2.469	.087***
Perceived Utility (PU2)	2.45	.089***
Perceived Utility (PU3)	.862	.424
Perceived Ease of Use (EOU1)	14.37	.000*
Perceived Ease of Use (EOU2)	3.84	.023**
Perceived Ease of Use (EOU3)	7.077	.001*
Perceived Credibility (CRD1)	11.162	.000*
Perceived Credibility (CRD2)	5.25	.006***
Perceived Credibility (CRD3)	4.553	.012**
Perceived Convenience (CON1)	6.520	.002*
Perceived Convenience (CON2)	3.21	.043**
Perceived Convenience (CON3)	3.261	.041**
Service Quality (SQ1)	3.044	.050**
Service Quality (SQ2)	4.749	.010*
Service Quality (SQ3)	.489	.614

(*) Significant at 1% level of significance, (**) Significant at 5% level of significance, (***)Significant at 10% level of significance

In table (5) extracted factors, factor loadings, and Cronbach's alphas for the ATM technology are summarized. Four factors are identified; benefits and ease, service quality, credibility and convenience.

The overall variability is around 68%, with high factor loadings, and over 80% Cronbach's alphas except for the convenience factor, which has a low alpha of only .314.

Table (6) further shows the regression model for ATM technology.

The proportion of the variance explained (R^2) for the dependent variables are 71% for attitude towards ATMs and 61% for intention to use ATMs were significant and their associated F statistics are also significant at 1% level of significance. The positive and significant coefficients and

high t-statistics for benefits and ease factor support both hypothesis one (H1) and hypothesis two (H2). Service quality has positive and significant coefficient also, thus supporting hypothesis five (H5). However, Credibility is not found to be a significant factor of influence on the customers' attitude.

Accordingly, hypothesis three (H3) is not supported by this result. The convenience factor has significant and positive coefficients with high t- value, hence supporting hypothesis four (H4). The regressions of the other dependent variable, behavioral intention, show similar results to that of attitude, except convenience is not significant as a factor.

However, when intention is regressed on attitude, a positive and highly significant coefficient emerges, indicating the role of attitude, as a mediator of behavioral intention.

This lay support for hypothesis six (H6).

Table (5): ATM Extracted Factor Loadings and Statistics

	FACT1	FACT2	FACT3	FACT4
PU1	.627			
PU2	.677			
PU3	.786			
EOU1	.809			
EOU2	.781			
EOU3	.751			
CON1	.688			
SQ1		.818		
SQ2		.794		
SQ3		.873		
CRD1			.810	
CRD2			.902	
CRD3			.732	
CON2				.626
CON3				.882
Cronbach's Alpha	.867	.822	.811	.314
F test	7.416	5.6	5.303	1.45
Significance-p value	(.000)	(.000)	(.000)	(.024)
% Variance explained	27.294%	16.072	14.465	10.134
% overall Variance explained				67.965 %

Table (6): ATM Regression

Independent Variable	Attitude (ATT)		Behavior Intention(BI)		Behavior Intention(BI)	
	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value
Intercept	-.148	.49	.216	.18	1.322	1.336
Benefits and ease	.116	9.60*	.469	9.74*		
Service Quality	.072	4.10*	.192	2.71*		
Credibility	-.002	.97	.006	.88		
Convenience	.186	4.35*	.046	.27		
ATT					.899	11.88*
Adjusted R-square	0.71		.61		.55	
F	60.82*		40.51*		141.19*	

(*) significant at 1% level

Mobile Banking Model

The outcomes of the analysis of the mobile banking model are shown in tables (7) and (8). Table (7) shows that only three factors are identified as antecedents of attitude towards mobile banking. These are benefits and ease, service quality and credibility.

The overall variance explained is 73%, with high factor loadings and high cronbach's alphas of .85, .92 and .96 respectively, reflecting a high level of internal consistency.

The results of the regression models in Table (8) show that R^2 are high, 55% for attitude towards mobile banking and 49.3% for intention to use mobile banking. Again, the "benefits and ease" factor has a positive and significant coefficient, thus supporting hypotheses one (H1) and two (H2). Service quality is also positive and significant (supporting hypothesis five (H5)), while credibility, as in the case of ATM model, is not significant, so support cannot be offered for hypothesis three (H3). For the other dependent variable in the regression, behavior intention is also influenced by the benefits and ease factor and service quality factor, but not the credibility factor. However, the behavioral intention to use internet banking is influenced by attitude towards the internet banking, thus reflecting the mediating nature of attitude.

Table (7): Mobile Extracted Factor Loadings and Statistics

Variables	FACT1	FACT2	FACT3
PU1	.786		
PU2	.799		
PU3	.689		
EOU1	.788		
EOU2	.753		
EOU3	.520		
CON1	.768		
SQ1		.840	
SQ2		.778	
SQ3		.775	
CRD1			.868
CRD2			.868
CRD3			.887
CON2	.691		
CON3	.740		
Cronbach's Alpha	.92	.85	.96
F test	11.91	6.48	24.82
Significance-p value	(.000)	(.000)	(.000)
% Variance explained	33.54%	19.95%	19.43%
% overall Variance explained			72.92%

Table (8): Mobile Regression

Independent Variable	Attitude (ATT)		Behavior Intention(BI)		Behavior Intention (BI)	
	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value
Intercept	1.01	.69	1.347	.844	2.443	2.15**
Benefits and ease	.193	3.15*	.274	4.15 *		
Service quality	.496	2.99*	.302	1.69***		
Credibility	.103	.844	.070	.54		
ATT					.826	8.26*
Adjusted R-square	**.55**		**.493**		**.62**	
F	**17.17 ***		**14.61***		**68.25 ***	

- (*) significant at 1% level
- (**) significant at 5% level
- (***) significant at 10% level

Internet Banking Model

The third model, on internet banking, returned similar pattern to the mobile banking model. As table (9) shows, also three almost identical factors emerged, with high factor loadings and strong

Cronbach's alphas, with an overall explained variance of 77.36%.

Table (9): Internet Extracted Factor Loadings and Statistics

	FACT1	FACT2	FACT3
PU1	.640		
PU2	.804		
PU3	.864		
EOU1			
EOU2	.820		
EOU3	.873		
CON1	.724		
SQ1			.717
SQ2			.906
SQ3			.789
CRD1		.943	
CRD2		.953	
CRD3		.931	
CON2	.721		
CON3	.709		
Cronbach's Alpha	.932	.972	.85
F test	14.81	35.68	6.46
Significance-p value	(.000)	(.000)	(.000)
% Variance explained	35.23%	22.30%	19.83%
% overall Variance explained			**77.36%**

Table (10): Internet Regression

Independent Variable	Attitude (ATT)		Behavior Intention(BI)		Behavior Intention(BI)	
	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value
Intercept	-1.01	.78	-.908	.38	2.025	1.09
Benefits and ease	.386	5.97*	.436	4.01 *		
Service quality	-.017	.18	.192	1.24		
Credibility	.324	2.51**	-.302	.15		
ATT					.844	5.40 *
Adjusted R-square	**.74**		**.486**		**.493**	
F	**28.72***		**10.13***		**29.2***	

- (*) significant at 1% level
- (**) significant at 5% level

The regression model, as shown in table (10), however, produced different results to those of mobile banking model with respect to the significance of the coefficients and their signs. The benefits and ease factor has similar result to that of mobile banking, but service quality and credibility traded places between the two models. Service quality is not significant under the internet model (thus H5 is not supported), while credibility is positive and highly significant, indicating the importance of credibility to the internet users for this sensitive service, lending support to H3. For the other dependent variable, as in other banking models, behavior intention is only influenced by the benefits and ease factor but not the other factors. However, the behavioral intention to use internet banking is influenced by attitude towards the internet banking, thus reflecting the mediating nature of attitude.
Overall, the "benefits and ease" factor and service quality both emerged as common factors among the three banking technologies, while attitude is clearly a fully mediating factor for the behavioral intentions to use each and every bank technology type.

Conclusions and Implications of the Study

This paper examined the banking technology acceptance in Sudan, and identified factors that influence customers' attitude towards three banking services technologies; ATM, mobile banking and internet. The study confirmed previous findings in this area of the paramount importance of perceived usefulness and ease of use (termed Benefits and Ease in this study) in determining the consumers' intentions to use bank technologies. In this study these factors are common among the three technologies.
However, the study clearly demonstrated that there are differences among the three banking technologies that must be considered by Sudanese banks in designing their growing technologybased banking.
Although there are differences among the three technologies, the differences are minimal between mobile and internet banking.
These two technologies have more in common regarding the customers' perceptions and intentions.
It should be pointed out, however, that the results of this study might have been influenced by the early introduction of ATMs in Sudanese banking sector, before the other two technologies considered in this study. This is in addition to the relatively higher level of sophistication needed to operate and use the other two services, especially the internet.

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